

FIGURE 3

PLAN E-1

Vicinity of JACKSON, MS

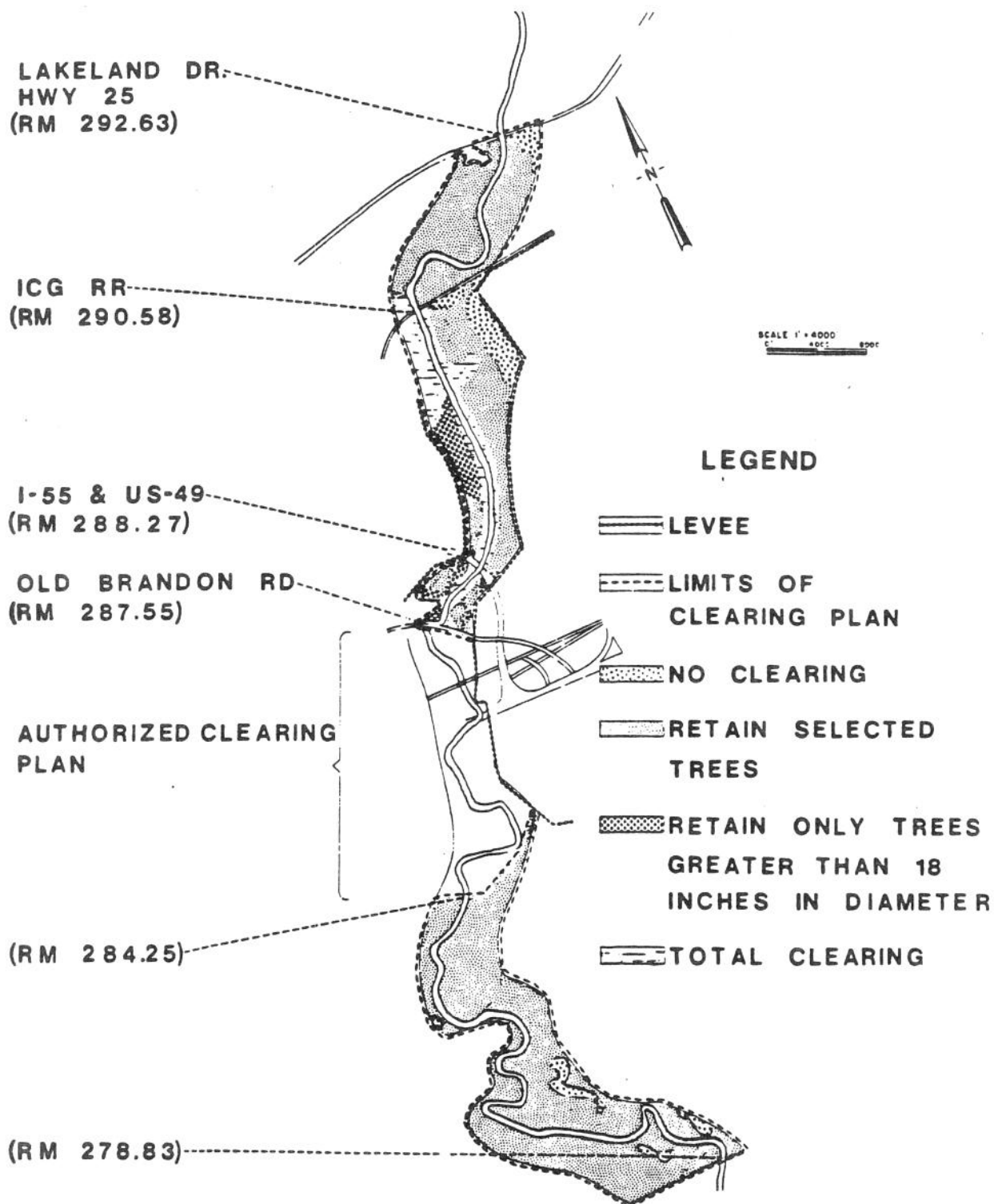


FIGURE 4

PLAN E-2

Vicinity of JACKSON, MS

TABLE 3
PHYSICAL FEATURES OF CLEARING PLANS

Plan	Total Clearing (acres)	Selective Clearing (acres)	Stone Bank Protection (tons)	Mitigation (acres)
D-1	1,402	--	--	1,317
D-2	--	1,247	--	511
E-1	2,562	--	11,000	2,408
E-2	--	2,225	11,000	987

94. Pumps. Pumping facilities were found not to be economically justified during reconnaissance studies. During feasibility studies, pumping facilities were again considered as additional flood damage reduction measures in combination with the levee and gravity floodgates. Locations for pump stations were evaluated at Hanging Moss Creek in Northeast Jackson; Town Creek, Lynch Creek, Caney Creek, and Hog Creek in Flowood; and Squirrel Branch in Richland. Benefits were developed based on additional damage reduction in these interior areas behind the levees. Preliminary costs based on comparable pump facilities constructed by the Vicksburg District were compared to these benefits. Costs exceeded benefits by at least a 8 to 1 margin for each of the areas. As a result, no further analysis of pumping facilities was conducted.

SCREENING OF ALTERNATIVE PLANS

95. Table 4 presents the summary of first cost, annual costs, annual benefits, excess benefits over cost, and the benefit-cost ratio for alternative Plans A-1, B-1, C-1, D-1, D-2, E-1, and E-3. As mentioned previously, the costs for Plans A-1, B-1, and C-1 were used to develop a cost curve to evaluate a full array of levee heights based on the risk analysis procedures. The economic data for the levee plans in Table 4 are based on this risk analysis. They are shown here only for comparison purposes with the clearing plans. As can be seen from Table 4, only one of the clearing plans was economically justified and that plan was only marginal. As a result, all clearing plans were eliminated from consideration.

TABLE 4
SUMMARY OF ECONOMIC ANALYSIS g/

Plan	First Cost (\$000)	Annual Cost (\$000)	Annual Benefits (\$000)	Excess Benefits (\$000)	Benefit-Cost Ratio (%)
A-1	68,094	7,505	12,976	5,471	1.7
B-1	78,310	8,604	14,124	5,520	1.6
C-1	82,775	9,053	14,568	5,515	1.6
D-1	7,987	1,136	1,218	82	1.1
D-2	4,963	785	445	(340)	0.6
E-1	15,111	2,053	1,684	(369)	0.8
E-2	10,346	1,549	829	(720)	0.5

NOTE: Numbers in parenthesis represent negative benefits.

g/ Based on May 1993 price levels, 7-3/4 percent discount rate.

OPTIMIZATION OF LEVEE HEIGHTS

96. A wide range of levee heights were evaluated using the new risk analysis procedures. This analysis is presented in detail in Appendix 6. The new approach abandons the concept of freeboard and, instead, incorporates elements of risk and uncertainty more directly in project formulation, evaluation, and design. A key feature of this analysis is that the levee-sizing parameter is design elevation, not the protection provided or risk factor. There is no "design flood" as such, and levee freeboard to account for uncertainty is not added. The results relate to levees that correspond to particular heights at a given location.

97. The risk analysis procedures allow for an evaluation of a wide range of levee heights with the ability to determine annual benefits at any given levee height. Cost data for the range of levee heights were determined based on the cost for Plans A-1, B-1, and C-1. Cost estimates for these plans are shown in Tables 5-7. A summary of first cost and annual cost is shown in Table 8. Annual costs for these three alternatives were used to develop annual costs for all levee heights considered in the optimization analysis using the risk analysis procedures.

98. For our analysis, the Highway 80 gage was selected as the location to relate various levee heights. A range of levee heights were evaluated and are identified by elevation of the top of the levee related to the stage at the river gage (Table 9). For example, the top of the levee for Plan A-1 is 44.8 feet, Plan B-1 is 47.7 feet, and Plan C-1 is 48.8 feet. These are not levee heights, but stages on the river gage relating to the elevation of the top of the levees.

99. The levee corresponding to a gage height of 47.0 feet was selected as the recommended plan. This plan provided the maximum excess benefits over cost and is therefore the NED plan. Table 10 shows that the recommended plan has a 99 percent chance of containing a flood with a 1 percent chance of occurring in any given year (the 100-year flood). This plan would have a 96 percent chance of containing a flood having a 0.33 percent chance of occurring in any given year (the 300-year flood). Table 11 indicates the effectiveness of the various levees. The recommended plan would reduce approximately 95 percent of the flood damages in the area. Since the risk analysis evaluates a wide array of alternative levee heights, it was not practical to present impacts in the EIS of each levee height. For display purposes, the plans corresponding to 44.8, 47.0, and 48.8 feet at the gage are displayed. These are identified as Plans A, B, and C, respectively, in the EIS.

TABLE 5
LEVEE PLAN A-1 (100-YEAR LEVEE)
JACKSON METROPOLITAN AREA

Item	Northeast Jackson	Lakeland/Eubanks	Town and Lynch Creeks	South Jackson	Island Relocations	Laurelwood Subdivision	Flomood	Richland	Belhaven Creek	Fairgrounds	East Jackson	Total
Pilot Study												
Real Estate Costs	1,100,000	515,000	433,000	547,000	15,328,000	141,000	1,543,000	1,134,000	193,000	123,000	553,000	21,061,000
Construction Costs	7,573,000	9,280,000	7,951,000	5,330,000	0	827,000	5,700,000	2,864,000	1,043,000	1,004,000	2,938,000	44,600,000
Mitigation Costs	625,000	51,000	17,000	202,000	0	34,000	371,000	152,000	12,000	34,000	135,000	1,433,000
Total First Costs	9,307,000	9,846,000	8,421,000	6,079,000	15,328,000	1,002,000	7,634,000	4,150,000	1,248,000	1,253,000	3,626,000	60,094,000
Major Replacement & Annual Operation and Maintenance	70,000	20,000	60,000	40,000	0	20,000	40,000	20,000	10,000	0	0	280,000
Flood Control	24,300	1,650	2,000	4,870	0	1,710	6,300	5,720	1,040	50	650	49,370
Mitigation	9,049	000	270	3,190	0	530	5,850	2,400	60	530	2,130	23,600
Total Annual Operation and Maintenance	34,140	2,450	3,250	8,060	0	2,240	12,230	8,120	1,120	580	2,780	74,970

9/ At year 50.

TABLE 6
LEVEE PLAN B-1 (1979 LEVEE)
JACKSON METROPOLITAN AREA

Item	Northeast Jackson	Lakeland/Edwards	Town and Lynch Creeks	South Jackson	Island Relocations	Laurelwood Subdivision	Flomood	Richland	Belhaven Creek	Palmyra	East Jackson	Total
Fixed Costs												
Real Estate Costs	1,187,000	576,000	585,000	553,000	15,528,000	177,000	1,839,000	1,238,000	317,000	233,000	748,000	22,981,000
Construction Costs	9,522,000	10,435,000	8,302,000	5,030,000	0	1,038,000	6,956,000	3,482,000	1,219,000	2,338,000	4,525,000	53,367,000
Mitigation Costs	855,000	58,000	19,000	214,000	0	39,000	233,000	175,000	20,000	97,000	252,000	1,942,000
Total Fixed Costs	11,564,000	11,069,000	8,906,000	6,397,000	15,528,000	1,254,000	9,028,000	4,815,000	1,556,000	2,668,000	5,525,000	78,310,000
Major Replacement of												
Levee System and Structures												
Flood Control	25,140	1,650	3,130	5,020	0	1,860	7,070	6,210	1,250	450	1,600	53,380
Mitigation	12,100	820	280	3,020	0	550	3,300	2,480	100	1,380	3,570	27,600
Total Annual Operation and Maintenance	37,240	2,470	3,410	8,040	0	2,410	10,370	8,690	1,350	1,830	5,170	80,980
9/ At year 50.												

TABLE 7
LEVEE PLAN C-1 (500-YEAR LEVEE)
JACKSON METROPOLITAN AREA

Item	Northeast Jackson	Labeland/ Eubanks	Town and Lynch Creeks	South Jackson	Island Relocations	Laurelwood Subdivision	Floodwood	Richland	Belhaven Creek	Palmyra	East Jackson	Total
Pipe Costs												
Real Estate Costs	1,245,000	983,000	631,000	557,000	15,528,000	187,000	2,175,000	1,433,000	317,000	248,000	812,000	23,916,000
Construction Costs	10,015,000	10,734,000	8,449,000	5,762,000	0	1,116,000	7,328,000	3,421,000	1,262,000	2,527,000	5,996,000	56,810,000
Mitigation Costs	893,000	61,000	20,000	223,000	0	41,000	243,000	183,000	20,000	101,000	264,000	2,849,000
Total First Costs	12,153,000	11,378,000	9,100,000	6,542,000	15,528,000	1,344,000	9,746,000	5,437,000	1,599,000	2,876,000	7,072,000	82,775,000
Major Replacement of	70,000	20,000	60,000	40,000	0	20,000	40,000	20,000	10,000	0	0	280,000
Annual Operation and Maintenance												
Flood Control	25,340	1,700	3,180	5,120	0	1,960	7,220	6,410	1,250	500	1,900	54,500
Mitigation	12,270	840	280	3,070	0	560	3,350	2,510	100	1,390	3,430	28,000
Total Annual Operation and Maintenance	37,610	2,540	3,460	8,190	0	2,520	10,570	8,920	1,350	1,890	5,330	82,500

g/ At year 50.

TABLE 8
FIRST COSTS AND ANNUAL COSTS
ALTERNATIVE LEVEE PLANS a/
JACKSON METROPOLITAN AREA, MISSISSIPPI

Levee Segment	First Cost (\$000)			Annual Cost @ 7-3/4% (\$000)		
	Plan A1 (44.8)	Plan B1 (47.7)	Plan C1 (48.8)	Plan A1 (44.8)	Plan B1 (47.7)	Plan C1 (48.8)
Northeast Jackson	9,307	11,564	12,153	1,090	1,344	1,413
Lakeland/Eubanks	9,846	11,069	11,378	1,174	1,317	1,356
Belhaven/Fairgrounds	2,501	4,224	4,475	268	449	472
Town and Lynch Creeks	8,421	8,906	9,100	836	882	903
South Jackson	6,079	6,397	6,542	564	593	610
Laurelwood/Flomood	8,636	10,282	11,090	991	1,180	1,272
East Jackson	3,626	5,525	7,072	373	571	729
Richland	4,150	4,815	5,437	389	448	510
Island Area Relocations	15,528	15,528	15,528	1,820	1,820	1,820
TOTAL	68,094	78,310	82,775	7,505	8,604	9,085

a/ Data used to develop annual cost curves used within risk analysis program.

TABLE 9
SUMMARY, INITIAL BENEFIT-COST ANALYSIS AND PROJECT SIZING

Stage at Gage (ft)	First Cost (\$000)	Annual Cost <u>a/</u> (\$000)	Expected Annual Benefits <u>b/</u> (\$000)	Expected Excess Benefits (\$000)	Expected Benefit- Cost Ratio
44.0	--	7,135	12,355	5,220	1.73
44.8	68,094	7,505	12,976	5,471	1.73
46.0	--	7,951	13,313	5,362	1.67
47.0 <u>c/</u>	--	8,326	13,912	5,586	1.67
47.7	78,310	8,604	14,124	5,520	1.64
48.8	82,775	9,053	14,568	5,515	1.61
49.5	--	9,485	14,568	5,083	1.54

a/ Based on May 1993 price levels, 7-3/4 percent discount rate, and 100-year project life.

b/ Includes wastewater treatment plant benefits.

c/ Recommended plan.

TABLE 10
PROJECT RELIABILITY

River Stage at Gage	Probability of Levee Containing Frequency Flow Event				
	50-Year (%)	100-Year (%)	300-Year (%)	500-Year (%)	SPF (%)
44.0	99	95	63	41	17
44.8	99	98	78	59	30
46.0		99	92	78	52
47.0 <u>a/</u>		99	96	89	68
47.7			98	93	76
48.8			99	97	88
49.5			99	98	93

a/ Recommended plan.

TABLE 11
PROJECT EFFECTIVENESS
PERCENT REDUCTION IN FLOOD DAMAGES

River Stage at Gage	Total Without-Project ^{a/} Damage (\$000)	Total With-Project Damage (\$000)	Total Damage Reduced (\$000)	Percent Damage Reduced
44.0	12,790	2,007	10,783	84
44.8	12,790	1,449	11,341	89
46.0	12,790	1,145	11,645	91
47.0 ^{b/}	12,790	603	12,187	95
47.7	12,790	416	12,374	97
48.8	12,790	13	12,777	100
49.5	12,790	13	12,777	100

^{a/} Includes wastewater treatment plant benefits.

^{b/} Recommended plan.

100. Project performance in reference to historical flood events is a valuable product of the risk and uncertainty analysis. Table 12 portrays the probabilities of occurrence of flood stages of the 1983 and 1979 flood events in comparison to the stage corresponding to top of levee for the recommended plan. The expected annual levee stage exceedance probability of the 1983 flood, a stage of 39.5 feet at the Highway 80 gage, is 2.9 percent; i.e., there is a 2.9 percent chance of a stage of 39.5 feet being exceeded in any year. Also, there is a 25 percent chance of occurrence of a stage of 39.5 feet within 10 years, 59 percent in 30 years, and 77 percent in 50 years. In comparison, the recommended plan, a stage of 47.0 feet at the Highway 80 gage, only has a .13 percent chance of exceedance in any year, a 1 percent chance of occurrence within 10 years, 4 percent in 30 years, and 6 percent in 50 years.

TABLE 12
PROJECT PERFORMANCE

Historical Events and Recommended Plan	Target Stage (ft)	Expected Annual Stage Exceedance Probability (%)	Long-Term Risk for Indicated Years (%)		
			10-Year	30-Year	50-Year
1983 Flood	39.5	2.9	25	59	77
1979 Flood	43.3	0.5	5	14	22
Recommended Plan	47.0	0.13	1	4	6

DESCRIPTION OF RECOMMENDED PLAN

GENERAL

101. Following selection of the recommended plan, more detail field data were gathered to support the design of the recommended plan. These included soil borings along the levee alignment and a baseline traverse and cross sections at 500-foot intervals. Detail design to support the baseline cost estimate was conducted following gathering of these data. The cost for the recommended plan increased from those shown during the screening of alternatives plans due to several factors. These included a more detail evaluation of real estate cost, refinement of levee grades, more detail design of the floodwall based on additional soils data, and site-specific design of spillways for gravity floodgates. All of the cost increases would affect each of the levee heights to the same degree and, therefore, would not affect plan selection.

COMPONENTS OF RECOMMENDED PLAN

General

102. The recommended plan consists of constructing approximately 21.9 miles of new levee, 3,720 feet of floodwall, enlarging 10.5 miles of the existing Jackson and East Jackson levees, building 9 box culverts and 9 concrete pipe water control structures, and constructing landside connecting ditches. Limited overbank clearing will be required to reduce stages at Lakeland Drive and minimize adverse impacts to the tailwater on the Ross Barnett spillway. This overbank clearing consists of a 100-foot strip on each side of the channel top bank from RM 290.5 to 301.5 and a 400-foot strip across six bendways. Plates 4-V-1 through 4-V-17 in Volume II show the proposed alignment of the levee and the location of major drainage structures and landside connecting ditches.

103. The recommended levees will be fully compacted, have 1 vertical on 3 horizontal side slopes, a 10-foot-wide crown, and a 5-foot-thick impervious riverside face. Because of the 1 vertical on 3 horizontal landside slope, no roadway addition was considered. Any roadway crown addition would have added substantial construction and real estate requirements. For new levee closures required at highways, railroads, etc., an earthen and sandbag closure would be required. The Fairgrounds and East Jackson levee enlargements would be constructed on the landside of the existing levee to minimize the necessity of impervious clay materials. Additional borrow borings would be taken during the preparation of plans and specifications to confirm this.

Levee Segments

104. Each of the recommended levee segments is described in the following paragraphs:

a. Northeast Jackson levee (Station 0+00 to 301+54). The Northeast Jackson levee (shown on Plates 4-V-1, 4-V-2, and 4-V-3) begins in the Jackson Country Club area near County Line Road and extends southward along the west bank of the Pearl River to Lakeland Drive (Highway 25). This proposed levee segment is approximately 5 miles long and has an average height of 22 feet. From Highway 25, a floodwall would extend south and westward to high ground just east of Eubanks Creek. This floodwall is required because of the highly developed area south of Lakeland Drive and the close proximity to LeFleur's Bluff State Park (Mayes Lakes area).

b. Eubanks Creek (Station 0+00 to 16+96). This segment, shown on Plate 4-V-3, begins at high ground just south of Lakeland Drive and extends southerly to Eubanks Creek, then continues in a westward direction to high ground. The levee would be 0.3 mile long and have an average height of 24.5 feet.

c. Belhaven Creek (Station 0+00 to 17+06). The Belhaven Creek Reach, shown on Plate 4-V-4, is an extension of the existing Fairgrounds levee necessitated by an increase in the level of protection for that area. The levee begins at high ground along the shoulder of the northbound lane of Interstate 55. The average height of the levee is 25 feet and is approximately 0.3 mile long.

d. Fairgrounds levee (Station 0+00 to 92+41). The entire Jackson levee, shown on Plate 4-V-4, will be enlarged to raise it 3 to 5 feet to provide the same level of protection as the new levees. In addition, the extension along the Fortification Street ramp will be raised to the proposed levee design grade and be connected to the Belhaven Creek levee. This segment would be approximately 1,600 feet long.

e. Town and Lynch Creeks levee (Station 0+00 to 71+95). This reach of levee, shown on Plate 4-V-5, begins on high ground near the Old Brandon Road crossing on the Pearl River (Woodrow Wilson Bridge) and proceeds southerly along the west bank of the river. The levee crosses Highway 80 and Interstate 20 before tying into high ground just south of Lynch Creek. The levee is approximately 1.4 miles long and has an average height of 17 feet.

f. South Jackson levee (Station 0+00 to 198+63). The South Jackson levee, shown on Plates 4-V-6 and 4-V-7, begins at high ground approximately 1 mile above the Jackson Sewage Treatment Plant and extends south along the west bank of the river until it reaches the disposal pond levees. A riverside enlargement of the perimeter levee around the plant would be required. The levee would then extend south from that point and ultimately tie back into high ground just north of Elton Road interchange on Interstate 55 south. Approximately 3.8 miles of levee would be required for this portion of the comprehensive levee system and the average height of the levee would be 10 feet.

g. Flowood levee (Station 0+00 to 279+24). This levee, shown on Plates 4-V-8 and 4-V-9, originates on high ground at a point approximately 0.25 mile west of Fannin Road and 1.25 miles north of Highway 25 (Lakeland Drive) and extends southwesterly around a newly developed residential area. From this point, the levee would continue approximately parallel to Lakeland Drive before turning southwesterly to follow along the east bank of the Pearl River. After crossing Lakeland Drive, the levee would continue to follow the east bank of the river until intersecting the existing East Jackson levee just west of Highway 468. This segment of levee would be approximately 5.3 miles long and have an average height of 13 feet.

h. East Jackson levee (Station 140+00 to 626+25). Approximately 8.7 miles of the existing East Jackson levee, shown on Plates 4-V-10 to 4-V-14, would be raised approximately 2 to 6 feet to provide design flood protection. Also, a 0.5-mile extension would be required at the downstream end tying into the ICGR embankment just north of Childre Road. The upper limits of the levee enlargement would end near Highway 468.

i. Richland levee (Station 0+00 to 264+34). The Richland levee, shown on Plates 4-V-15 to 4-V-17, would be "U-shaped" around the city of Richland. It would begin at high ground east of Highway 49 and extend northwesterly across Highway 49 to a point near the ICGR embankment. From this point, the levee turns westerly until it crosses the ICGR embankment. Then the levee would extend southerly to high ground 0.25 mile southeast of the intersection of Old Highway 49 and the ICGR. Approximately 5 miles of levee would be required for this portion of the levee system with an average height of 13 feet.

Gravity Floodgates

105. Structures recommended to be built through the project levee are listed below.

a. Northeast Jackson.

Station 25+30 - Two 60-inch-diameter concrete pipes

Station 110+93 - Two 12- by 12-foot box culverts

Station 147+18 - One 12- by 12-foot box culvert

Station 235+51 - Two 48-inch-diameter concrete pipes

b. Floodwall extension.

Station 291+11 - One 36-inch-diameter concrete pipe

c. Eubanks Creek.

Station 10+94 - Two 8- by 7-foot box culvert

d. Fairgrounds extension.

Station 9+64 - One 12- by 10-foot box culvert

e. Town and Lynch Creeks.

Station 16+65 - Three 12- by 12-foot box culverts

Station 65+90 - Three 12- by 12-foot box culverts

f. South Jackson.

Station 37+79 - Two 48-inch-diameter concrete pipes

Station 165+34 - Two 9- by 9-foot box culverts

g. Flowood.

Station 41+57 - Two 48-inch-diameter concrete pipes

Station 92+27 - One 48-inch-diameter concrete pipe

Station 175+05 - Two 6- by 5-foot box culverts

Station 197+24 - Two 36-inch-diameter concrete pipes

Station 257+94 - Two 8- by 6-foot box culverts

h. Richland.

Station 31+50 - One 36-inch-diameter concrete pipe

Station 152+74 - Two 48-inch-diameter concrete pipes

Property Relocations

106. Due to the increase in stages between the proposed levees in the vicinity of Lakeland Drive, existing development on each side of Lakeland Drive on the west bank of the Pearl River would be adversely affected. Stages could increase by as much as 1 foot in this area with the larger floods. Early investigations revealed that a levee or floodwall could not be constructed around this development without acquiring many of the 28 buildings at this location. As a result, the recommended plan includes total acquisition of this area. Two other commercial buildings adjacent to the Richland levee will likely require acquisition due to their proximity to Richland Creek.

Mitigation Measures

107. Following the detail design of the recommended plan, compensation requirements were recomputed. The recommended compensation measure of acquisition and reforestation of frequently flooded cleared lands was evaluated. Based on the analysis in Appendix 2, approximately 1,228 acres are

required to offset adverse terrestrial impacts of the recommended plan. Due to the fact that mitigation will be accomplished during construction of the project and all lands will be acquired from willing sellers, the specific location of the mitigation land cannot be determined until immediately prior to the time of acquisition. Table 13 depicts the criteria used in the selection of the lands at the time of acquisition. Development measures proposed for the mitigation lands include planting of appropriate open areas in bottom-land hardwood species, establishing necessary access roads, surveying and establishing boundaries, and establishing a management headquarters.

TABLE 13
MITIGATION SITE SELECTION CRITERIA

DRAINAGE BASIN LOCATION CRITERIA	
1.	Lower Pearl River Basin (south of Jackson and west of Interstate 59)
2.	Upper Pearl River Basin (north of Jackson)
3.	Bogue Chitto River Basin
4.	Bayou Pierre River Basin
5.	Mississippi Delta-Yazoo River Basin, Sunflower River Basin, etc.
6.	Lower Big Black River Basin (west of Interstate 55)
7.	Leaf River Basin
EXISTING LAND USE TYPE CRITERIA	
1.	Degraded wetlands in riverine flood plains; e.g., abandoned surface mines, actively farmed lands, pasture lands
2.	Degraded upland forests in riverine flood plains
3.	Cutover forested wetlands
4.	Mature bottom-land forests
LAND REHABILITATION METHODS CRITERIA	
1.	Wetland restoration including replacement of hydrology and woody vegetation
2.	Wetland reforestation where hydrology is in place
3.	Reforestation of uplands associated with riverine habitats
4.	Preservation of a unique habitat or a habitat important to a Federally listed threatened or endangered species
SPECIFIC LAND LOCATION CRITERIA	
1.	Sites adjacent to state management areas, national wildlife refuges, U.S. Forest Service lands, etc., that are managed for fish and wildlife
2.	Sites adjacent to existing forested areas
3.	Sites adjacent to farmed areas that would provide corridors between wooded areas
4.	Sites adjacent to developed residential areas
5.	Sites adjacent to developed commercial areas

SUMMARY OF RECOMMENDED FLOOD CONTROL PLAN

108. Table 14 shows a breakdown of the costs for the recommended plan. An economic summary is shown in Table 15.

TABLE 14
SUMMARY OF FIRST COST ^{a/}
RECOMMENDED FLOOD CONTROL PLAN

Account	Item	Amount (\$)
01	Lands and Damages ^{b/}	28,623,440
02	Relocations	1,066,180
06	Fish and Wildlife Facilities	695,797
11	Levees and Floodwalls	34,431,937
15	Floodway Control and Diversion Structures	17,338,186
30	Planning, Engineering, and Design	12,046,719
31	Construction Management	5,177,000
	TOTAL	99,379,259

^{a/} October 1994 price levels.

^{b/} Includes mitigation lands.

TABLE 15
ECONOMIC SUMMARY
RECOMMENDED FLOOD CONTROL PLAN

Item	Amount
First Cost (\$)	99,379,000
Interest During Construction (\$)	16,839,000
Total Investment (\$)	116,218,000
Interest (\$)	9,007,000
Sinking Fund (\$)	5,000
Major Replacement (\$)	227
Annual Operation and Maintenance (\$)	86,000
Total Annual Cost (\$)	9,098,000
Expected Annual Benefits (\$)	13,912,000
Excess Benefits (\$)	4,814,000
Benefit-Cost Ratio (%)	1.53
Probability of Benefit-Cost Ratio Greater Than 1.0 (%)	84
Project Effectiveness (%)	95

DESIGN AND CONSTRUCTION CONSIDERATIONS

109. Construction is estimated to be initiated in 1999 and be functionally complete in 2003. The design of the project will be based on current technical guidelines and additional engineering data or surveys that may be necessary. Remaining design requirements consist of preparation of plans and specifications for the various levee segments, preparation of soil reports for drainage structures, and preparation of a feature design memorandum and plans and specifications for the floodwall segment. A Feature Design Memorandum (FDM) (HaHa Bayou Gravity Structure, Sicily Island Project, Red River Backwater Area) has been submitted in lieu of an FDM for each drainage structure. This FDM will serve as a precedent for all future designs of similar type. Although the design of the pipe will not be shown in the FDM, the design procedures to compute the required "D" load as outlined in Engineer Manual 1110-2-2902 are noncomplex, and a formal documentation of these procedures are not considered necessary.

OPERATION AND MAINTENANCE REQUIREMENTS

110. The Pearl River Basin Development District, the local sponsor, is responsible for 100 percent of the operation and maintenance of the project. An operation and maintenance manual detailing operational requirements and

preventative and corrective maintenance procedures for the gravity floodgates will be prepared during the design and construction phases. A water control plan to document the operation of the floodgates will be developed during the construction phase of the project.

111. Levee maintenance will consist of sod maintenance, primarily routine mowing, and replacement of gravel. Maintenance of the overbank and bendway clearing, and the connecting ditches at some of the structures will consist of spraying for vegetation control with Environmental Protection Agency approved herbicides. Maintenance at the structures includes rust preventative measures, care of rip rap on outlet channels, and vegetation control.

112. Since the economic life of the project is 100 years, some major rehabilitation and replacement are anticipated. Estimated cost include the replacement of all mechanical and electrical equipment at the gravity floodgates at year 50.

113. Table 16 presents a summary of the estimated operation and maintenance costs and major replacement cost for the recommended flood control project.

TABLE 16
SUMMARY OF OPERATION AND MAINTENANCE COST
RECOMMENDED FLOOD CONTROL PLAN

Item	Amount (\$)
Levees	
Sod maintenance (1,273 acres)	22,150
Gravel maintenance (21.9 miles)	8,760
Floodway	
Spraying (242 acres)	14,520
Ditches	
Spraying (1.7 miles)	1,190
Structures	
Flap gate operation and maintenance (3 each)	1,200
Slide gate maintenance (15 each)	9,000
Slide gate operation (15 each)	1,200
Inlet/outlet maintenance (18 each)	1,500

TABLE 16 (Cont)

Item	Amount (\$)
Mitigation	
Building and equipment	3,000
Road maintenance	2,000
Boundary maintenance	800
Vegetation and water level maintenance	1,500
Timber management	3,000
Project administration	6,000
Custodial functions	10,000
TOTAL	85,820

RECREATION PLAN

114. As a part of the feasibility studies, PRBDD (the local sponsor) conducted a study of the recreation needs and opportunities. As a result of these studies, a comprehensive recreation plan was identified for implementation with the recommended flood control plan. Federal participation in recreation is limited to development on lands provided for the basic project, except for separable lands required for access, parking, sanitation, and safety. The major recreation feature proposed is a continuous multipurpose trail system closely associated with the levee development. Access to the trail system will be provided at recreation node sites which will provide for vehicular access and parking. The total cost of the comprehensive recreation plan was \$32.9 million. The local sponsor understands the cost-sharing limitations on recreation. Estimated cost of cost-sharable features based on the current plan is approximately \$6.0 million. Appendix 8 contains a complete presentation of the recreation investigations.

SUMMARY OF ECONOMIC, ENVIRONMENTAL,
AND OTHER SOCIAL EFFECTS

115. Table 17 illustrates the environmental impacts for the recommended plan.

TABLE 17
SUMMARY OF ENVIRONMENTAL IMPACTS OF RECOMMENDED PLAN

Resource	Impacts
Terrestrial Habitat	Net loss of 2,503 AAHU's, 891 acres of bottom-land hardwoods, 60 acres of mixed-pine hardwoods, 34 acres of pine, and 39 acres of cypress-tupelo. Requires 1,228 acres of reforestation/management.
Aquatic Habitat and Fisheries	Temporary degradation of aquatic habitat with corresponding adverse impact to associated fisheries during construction. Borrow areas would create 778 acres of aquatic habitat.
Waterfowl Habitat	Reduction in forested flood plain would have minor adverse impacts to resident, and to a lesser extent, migratory waterfowl.
Water Quality	Increased turbidity and lowered DO levels during construction; no long-term significant impacts.
Ground Water	No impact expected
Endangered Species	No impact expected
Air Quality	Short-term releases of CO, NO, and particulates would be emitted during construction phase; no long-term adverse impacts.
Wetlands	Wetland conversion would total approximately 931 acres. Compensated by terrestrial mitigation.
Cultural Resources	No impact expected

116. Table 18 shows the System of Accounts. Four accounts (NED, Environmental Quality (EQ), Regional Economic Development (RED), and Other Social Effects (OSE)) are used to display impacts. These four accounts encompass all significant effects of a plan as required by NEPA of 1969 and social well-being as required by Section 122 of the Flood Control Act of 1970. The NED account shows effects on the national economy. The EQ account shows the effects on ecological, cultural, and esthetic attributes of significant natural and cultural resources that cannot be measured in monetary terms. The RED account shows the regional incidence of NED effects, income transfers, and employment effects. The OSE account presents the urban and community impacts and effects on life, health, and safety.

TABLE 18
SUMMARY COMPARISON, RECOMMENDED PLAN
JACKSON METROPOLITAN AREA, MISSISSIPPI

Item	Base Condition/Objectives (1994)	Without-Project Condition (No-Action)	Condition with Recommended Plan
1. <u>Description, Base Condition/Plan</u>	Major need exists for alleviation or reduction of flooding from Pearl River. There are 6,551 residential and 1,630 non-residential structures subject to flooding.	No construction of flood control project. With no-action or without-project conditions, needs described for area would not be met. Existing flooding and flood damages would continue.	Plan provides for 21.1 miles of new levees along the Pearl River and enlarging 11 miles of the existing Fairgrounds and East Jackson levees, constructing 18 gravity floodgates, and 168 acres of overbank clearing.
2. <u>Plan Impacts a/</u> a. <u>National Economic Development (NED)</u>	(Objective) Flood damage reduction for existing development in metropolitan area. Currently, average annual damages are \$11.5 million.	No impact--objectives would not be met.	Net NED benefits are \$4.8 million annually.
b. <u>Environmental Quality (EQ)</u>	(Objective) Preservation, protection, and enhancement of area's natural resources/environment.	The current value of most of the area's natural resources and environment will continue.	Recommend plan include a mitigation plan which would result in acquisition by fee of 1,228 acres of frequently flooded cleared lands to be reforested, increasing terrestrial and wetland resources. Recommended plan will result in unavoidable losses, but mitigation plan replaces the impacted resources.
c. <u>Regional Economic Development (RED)</u>	(Objective) Improvements in regional economic growth and development (added employment, increase income, etc.).	Existing regional economic growth trends would continue.	Total income effects are reflected by total project-related benefits of \$13.9 million annually. Project would provide for economic growth and development. Short-term impacts expected on employment/income from project construction.

TABLE 18 (Cont)

Item	Base Condition/Objectives (1994)	Without-Project Condition (No-Action)	Condition with Recommended Plan
d. <u>Other Social Effects (OSE)</u>	(Objective) Improvements in well-being of area residents, reflected by desirable economic growth, community cohesion, improvements in quality of life, removal/reduction in threat of flooding and flood damages, etc.	Existing area economic growth conditions would prevail. Threat of flooding and flood damages would continue.	Community cohesion would be strengthened over project life due to alleviation/reduction of flood threat and associated flood damages.
3. <u>Plan Evaluation</u>			
a. <u>Acceptability b/</u>	Not applicable.	Unacceptable to local interests.	Acceptable.
b. <u>Completeness c/</u>	Not applicable.	Not applicable.	Remaining flood control needs could be reduced through local flood control improvements.
c. <u>Effectiveness d/</u>	Not applicable.	Not applicable.	Overall, 95 percent reduction in damages.
d. <u>Efficiency e/</u>	Not applicable.	Not applicable.	Excess benefits over costs (MED benefits) are \$4.8 million annually.
e. <u>Geographic Scope</u>	Not applicable.	Encompasses study area (economic base area which includes Winda and Rankin Counties), including the project area.	Encompasses the project area.
f. <u>Hydrologic Effects</u>	Not applicable.	Not applicable.	Plan includes measures to eliminate adverse hydrologic effects in the project area. No adverse hydrologic effects would occur downstream or upstream of the project area.
g. <u>Benefit-Cost Ratio</u>	Not applicable.	Not applicable.	1.53
h. <u>Reversibility</u>	Not applicable.	Not applicable.	Possible, but highly improbable.
i. <u>Stability</u>	Not applicable.	Continued lack of needed flood protection would create continued significant flood damages and would be a deterrent to area growth and development.	With plan implementation, "medium stability" could be achieved.

TABLE 18 (Cont)

Item	Base Condition/Objectives (1994)	Without-Project Condition (No-Action)	Condition with Recommended Plan
j. <u>Implementation Responsibility</u>	Not applicable.	Not applicable.	Federal and non-federal (local sponsor) actions required to implement plan.

a/ All impacts measured from "without-project" conditions.

b/ Acceptability is the workability and viability of the recommended plan with respect to acceptance by state and local entities and the public and compatibility with existing laws, regulations, and public policies.

c/ Completeness is the extent to which the recommended plan provides and accounts for all necessary investments or other actions to ensure the realization of the planned effects. This may require relating the plan to other types of public or private plans if the other plans are crucial to realization of the contributions to the objective.

d/ Effectiveness is the extent the recommended plan alleviates the specified problems and achieves the specified opportunities.

e/ Efficiency is the extent to which the recommended plan is the most cost-effective means of alleviating the specified problems and realizing the specified opportunities, consistent with protecting the nation's environment.

117. Other social effects are summarized in the following paragraphs.

a. Community cohesion and community growth will be strengthened from construction of the recommended plan due to the alleviation/reduction of flood damages and threat of flooding. No adverse impacts to community cohesion are anticipated.

b. Implementation of the recommended plan is not expected to have any significant impact on study area population trends.

c. Noise created by project construction will be a temporary nuisance with the project area absorbing the impacts of these noises.

d. It does not appear that implementation of the recommended plan will displace any families in the project area. Approximately 30 commercial buildings affected about 100 businesses will be displaced. These affected businesses will be fully compensated under the terms of Public Law 91-646. Actual displacement will be determined during the plans and specifications phase.

e. Conversion of cleared lands to bottom-land hardwoods for mitigation purposes will provide beneficial impacts to the esthetic value of the area. Land disturbance during project construction will be remedied as construction is completed and vegetation recovers. Reduction in bottom-land hardwoods and wetlands due to project construction will create adverse impacts to esthetic values.

PLAN IMPLEMENTATION

INSTITUTIONAL REQUIREMENTS

118. The draft report will be disseminated for review by Federal, state, and local agencies and interested members of the public in April 1995. A public meeting will be held during this review period to solicit comments from the affected community regarding the recommended plans. Details of these specific coordination events will be presented in Appendix 1.

DIVISION OF PLAN RESPONSIBILITIES

General

119. The implementation of the recommended plan will be the responsibility of the Corps and PRBDD. Implementation of mitigation requirements will be accomplished in conjunction with other Federal and state agencies who assist with fish and wildlife resources.

Corps Responsibilities

120. The design and construction of the project will be accomplished by the Vicksburg District in accordance with the Project Management Plan dated _____ and approved _____.

Local Sponsor Responsibilities

121. In accordance with Section 103 of the Flood Control Act of 1986, local interests are required to furnish assurances to the Secretary of the Army that they will:

a. Provide, without cost to the United States, all necessary lands, easements, and rights-of-way, including borrow and excavated material disposal areas necessary for construction, mitigation, operation, replacement, and rehabilitation and maintenance of the project.

b. Accomplish, without cost to the United States, all necessary alterations and relocations to roads, railroads, pipelines, cables, and other facilities, including interior drainage, required by the construction of the project, excluding facilities necessary to maintain the existing interception and disposal of interior drainage at the line of protection.

c. Hold and save the United States free from damage resulting from transfer of water from one watershed to another or due to construction, operation, and maintenance of the project except where such damages are due to the fault or negligence of the United States or its contractors.

d. Provide, during the period of construction, a minimum cash contribution of 5 percent of the total structural flood control project costs. If the value of the total structural flood control contributions, which includes the cost of mitigation (5 percent cash plus all necessary lands, easements, rights-of-way, relocations, including borrow and excavated material disposal areas), represents less than 25 percent of the total structural flood control project costs, the local sponsor shall provide, during the period of construction, an additional cash contribution in the amount necessary to make its total contribution equal to 25 percent of the total structural flood control project costs.

e. Maintain, operate, and replace as necessary all features of the project in accordance with regulations prescribed by the Secretary of the Army, including levees, floodwalls, floodgates, approach channels, and all interior drainage features, including, but not limited to, drainage structures, drainage ditches, canals, and including all mitigation features.

f. Prior to initiation of construction, prescribe and enforce regulations or other management techniques to prevent encroachment on flood plain areas, channels, rights-of-way, and levees along with interior drainage, ponding, and sump areas, necessary for proper functioning of the project.

g. Participate in and comply with applicable Federal flood insurance and flood plain management programs and at least annually publicize flood plain information in the areas concerned and provide this information to zoning and other regulatory agencies, for their guidance and leadership in preventing unwise future development in the flood plain and in adopting such regulations as may be necessary to ensure compatibility between future development and protection levels provided by the project.

h. Comply with the applicable provisions of the Uniform Relocations Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646). (This Act was amended by Title IV of the Surface Transportation and Uniform Relocations Assistance Act of 1987 (Public Law 100-17) and the Uniform Regulations contained in 49 CFR Part 24. The local sponsor must also provide the assurance that they will comply with these amended requirements.)

i. Comply with Section 221 of Public Law 91-611, Flood Control Act of 1970, approved 31 December 1970, which provides that the construction of any water resource project by the Corps shall not be started until each non-Federal interest has entered into a written agreement to furnish its required cooperation for the project.

j. Comply with Section 601 of Title VI of the Civil Rights Act of 1964 (Public Law 88-352) that no person shall be excluded from participation in, denied the benefits of, or subject to discrimination in connection with the project on the grounds of race, creed, or national origin.

k. Provide during the period of construction, 50 percent of the cost assigned to separable recreation features.

l. Accomplish any remediation activities required under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) at 100 percent non-Federal cost.

122. The local sponsor for this project is PRBDD. The local sponsor has cost shared in the feasibility phase of this project and has indicated their intent by letter to continue to sponsor the project which is provided as Attachment 1.

123. A Project Cooperation Agreement will be executed prior to initiation of construction.

VIEWS OF LOCAL SPONSOR AND OTHER AGENCIES

124. The local sponsor, PRBDD, concurs in the recommended plan. The U.S. Fish and Wildlife Service has included a letter in their Fish and Wildlife Coordination Act Report concurring in the recommended plan subject to the recommendations included in that report (Appendix 7). Comments pertaining to the public review of the report will be presented in Appendix 1.

SUMMARY OF COORDINATION, PUBLIC VIEWS, AND COMMENTS

125. Intense coordination has been maintained with the local sponsor. Quarterly meetings of the Executive Committee have been held throughout the study process. PRBDD staff participated daily during the past 3 years of this study.

126. Coordination has been maintained with state and Federal agencies. The U.S. Fish and Wildlife Service, the Environmental Protection Agency, SCS, and MDWFP were invited to be cooperating agencies regarding the environmental aspects of the study.

127. Components pertaining to the public review of the draft report will be presented in Appendix 1.

REMAINING ISSUES

128. During review of the draft report by the Office of Chief of Engineers, concerns were raised regarding the economic justification of separable levee segments. An economic analysis of each separate levee segment was conducted which showed that all segments with the exception of the Eubanks Creek levee segment and the floodwall segment south of Lakeland Drive. As a result, further analysis are being conducted to determine whether the Lakeland Drive/Eubanks Creek area will remain a part of the Federally recommended plan.

RECOMMENDATIONS

129. I recommend that improvements for flood control in the Jackson Metropolitan Area, Mississippi, as discussed in this report be approved for implementation as a Federal project with such modification thereof as in the discretion of the Commander, Office of Chief of Engineers, may be advisable. The total first cost of the project based on October 1994 price levels is \$99,379,000.

130. The recommendations contained herein reflect the information currently available and current Departmental policies governing formulation of individual projects. They do not reflect program and budgeting priorities inherent in the formulation of a national Civil Works construction program nor

the perspective of higher review levels within the Executive Branch. Consequently, the recommendations may be modified before they are transmitted to Congress as proposals for authorization and implementation funding. However, prior to transmittal to Congress, the sponsor, the States, interested Federal agencies, and other parties will be advised of any modifications and will be afforded an opportunity to comment further.

131. The recommendation is subject to cost-sharing, financing, and other applicable requirements of Public Law 99-662 for this kind of project. Also, this recommendation is subject to the non-Federal sponsor agreeing to comply with applicable Federal laws and policies, including the following requirements:

a. Provide a minimum of 25 percent, but not to exceed 50 percent, of total project costs assigned to structural flood control, as further specified below:

(1) Provide, during construction, a cash contribution equal to 5 percent of total project costs assigned to structural flood control.

(2) Provide all lands, easements, rights-of-way, and suitable borrow and dredged or excavated material disposal areas, and perform or ensure performance of all relocations determined by the Federal Government to be necessary for the construction, operation, and maintenance of the project.

(3) Provide all improvements required on lands, easements, and rights-of-way to enable the proper disposal of dredged or excavated material associated with the construction, operation, and maintenance of the project. Such improvements may include, but are not necessarily limited to, retaining dikes, wastewaters, bulkheads, embankments, monitoring features, stilling basins, and dewatering pumps and pipes.

(4) Provide, during construction, any additional amounts as are necessary to make its total contribution equal to 25 percent of total project costs assigned to structural flood control.

b. For so long as the project remains authorized, operate, maintain, repair, replace, and rehabilitate the completed project or functional portion of the project, at no cost to the Federal Government, in a manner compatible with the project's authorized purposes and in accordance with applicable Federal and state laws and regulations and any specific directions prescribed by the Federal Government.

c. Grant the Federal Government a right-to-enter, at reasonable times and in a reasonable manner, upon property that the non-Federal sponsor, now or hereafter, owns or controls for access to the project for the purpose of

inspection, and, if necessary after failure to perform by the non-Federal sponsor, for the purpose of completing, operating, maintaining, repairing, replacing, or rehabilitating the project. No completion, operation, maintenance, repair, replacement, or rehabilitation by sponsor of responsibility to meet the non-Federal sponsor's obligations, or to preclude the Federal Government from pursuing any other remedy at law or equity to ensure faithful performance.

d. Hold and save the United States free from all damages arising from the construction, operation, maintenance, repair, replacement, and rehabilitation of the project any project-related betterments, except for damages due to the fault or negligence of the United States or its contractors.

e. Keep and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the project in accordance with the standards for financial management systems set forth in the Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments at 32 Code of Federal Regulations (CFR) Section 33.20.

f. Perform, or cause to be performed, any investigations for hazardous substances as are determined necessary to identify the existence and extent of any hazardous substances regulated under the CERCLA (Public Law 96-510), as amended, 42 United States Code (USC) 9601-9675, that may exist in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for the construction, operation, and maintenance of the project. However, for lands that the Federal Government determines to be subject to the navigation servitude, only the Federal Government shall perform such investigations unless the Federal Government provides the non-Federal sponsor with prior specific written direction, in which case the non-Federal sponsor shall perform such investigations in accordance with such written direction.

g. Assume complete financial responsibility, as between the Federal Government and the non-Federal sponsor for all necessary cleanup and response costs by any CERCLA-regulated materials located in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for the construction, operation, or maintenance of the project.

h. To the maximum extent practicable, operate, maintain, repair, replace, and rehabilitate the project in a manner that will not cause liability to arise under CERCLA.

i. Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646), as amended, by Title IV of the Surface Transportation and Uniform Regulation Assistance Act of 1987 (Public Law 100-17), and the Uniform Regulations contained in 49 CFR Part 24, in acquiring lands, easements, and rights-of-way required for the construction, operation, and maintenance of the

project, including those necessary for relocations, borrow materials, and dredged or excavated material disposal, and inform all affected dredged or excavated material disposal, and inform all affected persons of applicable benefits, policies, and procedures in connection with said Act.

j. Comply with all applicable Federal and state laws and regulations, including, but not limited to, Section 601 of the Civil Rights Act of 1964 (Public Law 88-352) (42 USC 2000d), and Department of Defense Directive 5500.11 issued pursuant thereto, as well as Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army."

k. Provide 25 percent of that portion of total historic preservation mitigation and data recovery costs attributable to structural flood control that are in excess of 1 percent of the total amount authorized to be appropriated for structural flood control.

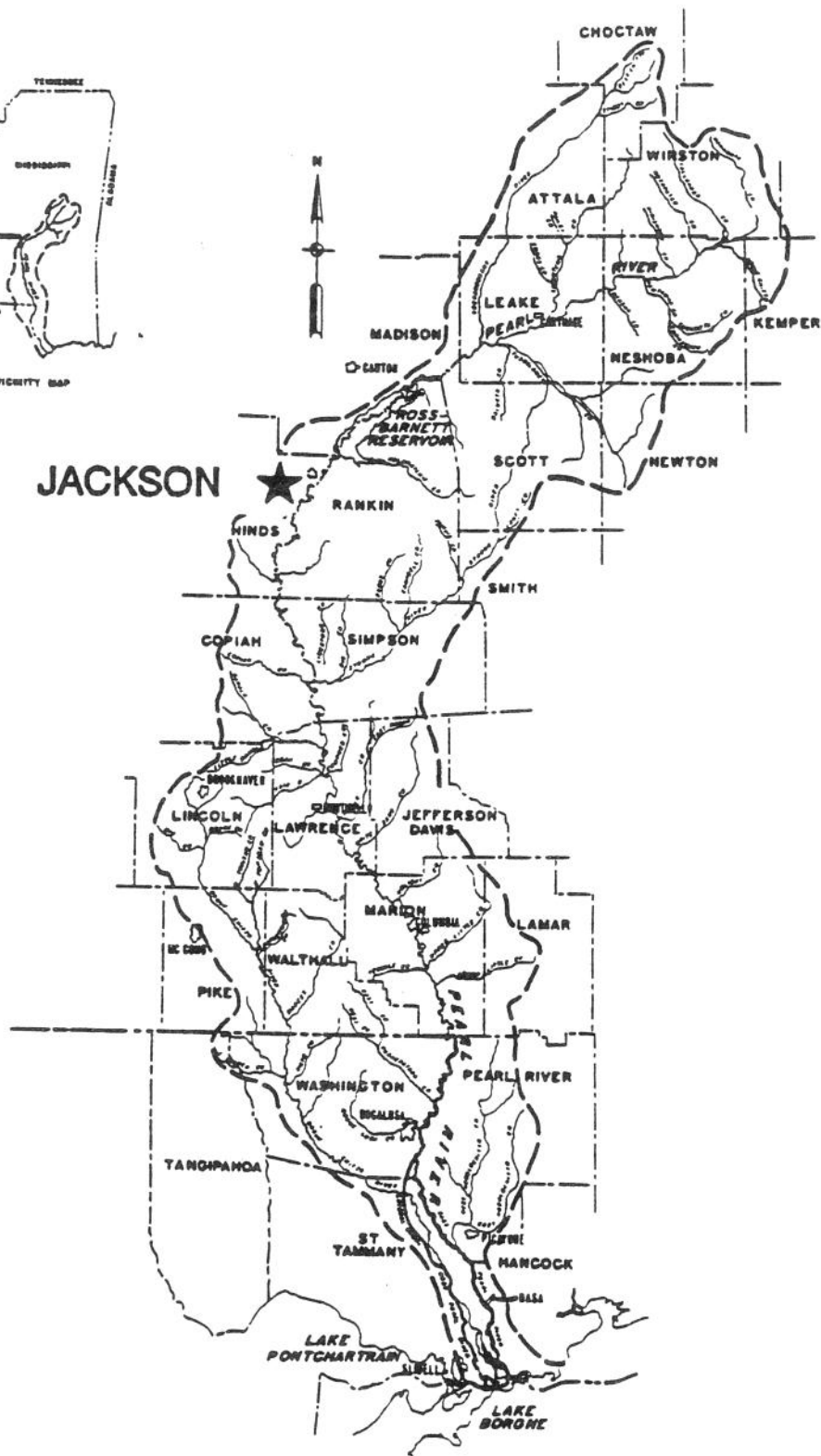
l. Participate in and comply with applicable Federal flood plain management and flood insurance programs.

m. Not less than once each year, inform affected interests of the extent of protection provided by the project.

n. Publicize flood plain information in the area concerned and provide this information to zoning and other regulatory agencies for their use in preventing unwise future development in the flood plain and in adopting such regulations as may be necessary to prevent unwise future development and ensure compatibility with the protection provided by the project.

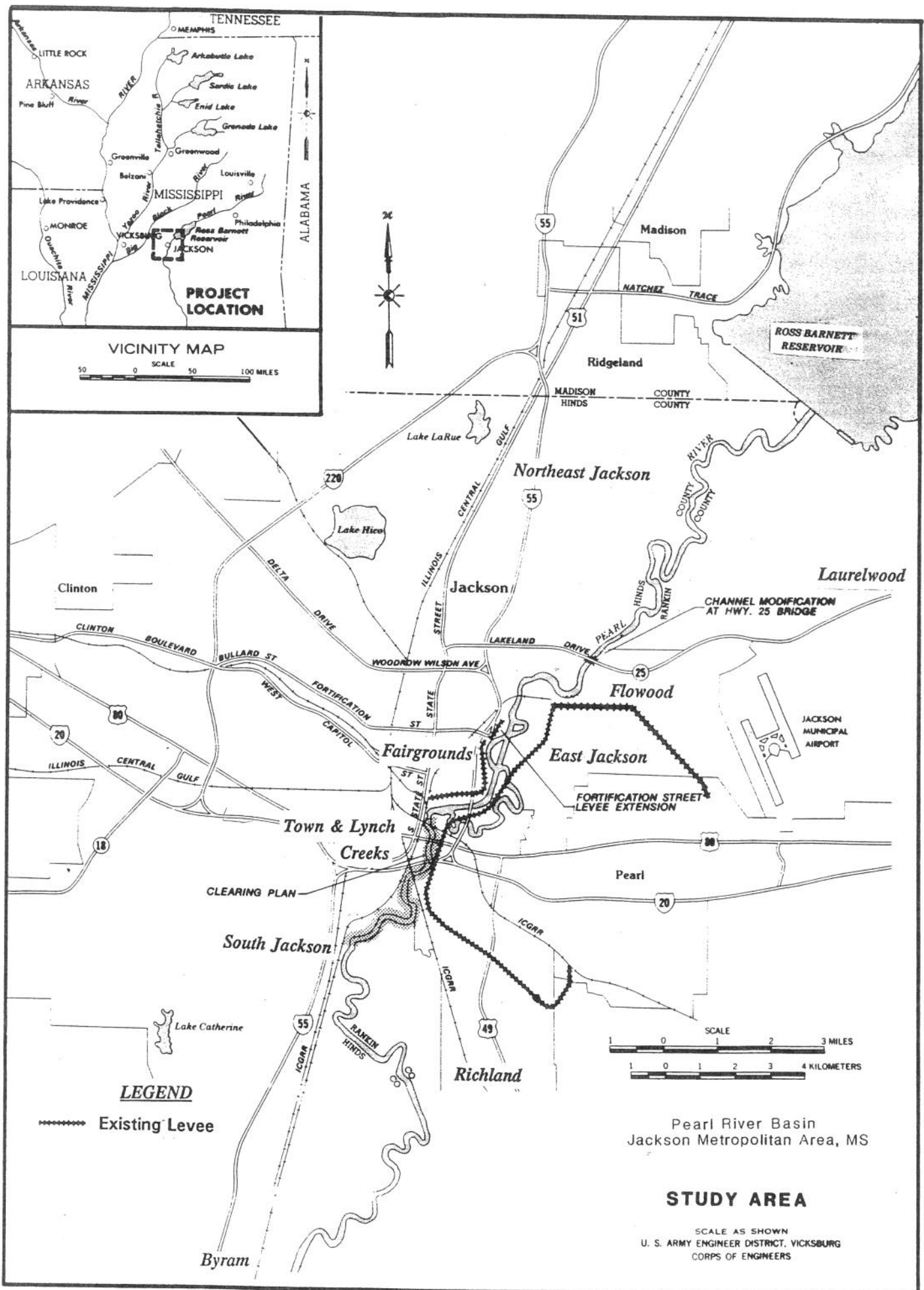
o. Provide, during the period of construction, 50 percent of the cost assigned to separable recreation features.

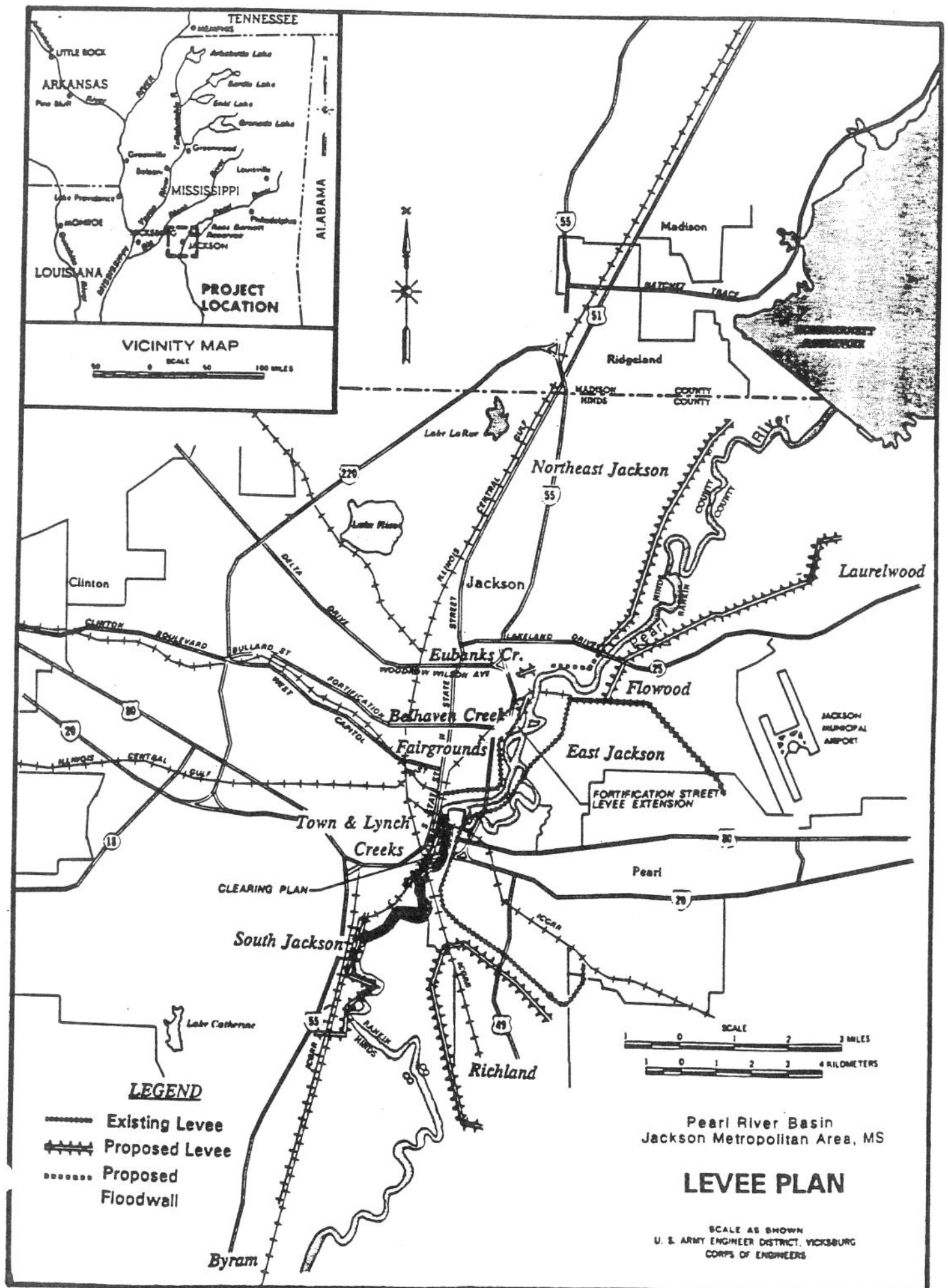
Gary W. Wright
Colonel, Corps of Engineers
District Engineer



PEARL RIVER BASIN MISSISSIPPI AND LOUISIANA







ATTACHMENT 1

**LETTER FROM PEARL RIVER BASIN
DEVELOPMENT DISTRICT**



Pearl River Basin Development District

An Independent Agency of the State of Mississippi
2304 Riverside Drive P. O. Box 5332 Jackson, Mississippi 39296-5332 (601) 354-6301

Mike Davis, Executive Vice President

December 22, 1994

Colonel Stanley G. Phernambucq
District Engineer
Vicksburg District
U.S. Army Corps of Engineers
2101 North Frontage Road
Vicksburg, MS 39180

Dear Colonel Phernambucq:

As the local sponsor for the Jackson/Metropolitan Area, Mississippi Feasibility Study, the Pearl River Basin Development District is aware that the non-federal portion of the recommended flood control project totals approximately \$38,208,000. Additionally, other costs will be incurred with the construction of recreational features.

Legislation has been prepared and will be submitted to the Mississippi Legislative Session beginning in January, 1995. The legislation authorizes the State of Mississippi to issue \$20 million dollars in general obligation bonds to defray a portion of the costs incurred to provide lands, easements, rights of way and relocations. The legislation will also authorize the Pearl River Basin Development District to issue \$30 million dollars in bonds to pay the remaining portion of the non-federal share of the flood control project. A portion of the District's bond funds will be used for the construction of recreational features.

As mentioned above, the bonds issued by the State of Mississippi will be general obligation bonds and backed by the full faith and credit of the State. Bonds issued by the Pearl River Basin Development District will be repaid solely from pledge of revenues received by the District pursuant to agreements with other governmental entities. Issuance of bonds by the State of Mississippi and the Pearl River Basin Development District will also be dependent upon approval of the flood control project by the U.S. Army Corps of Engineers and Congressional authorization.

Please call me if I can provide you with any additional information.

Sincerely,

Mike Davis
Executive Vice President

MD/rc

Attachment 1